

THE SOUTH AFRICAN SPECIES OF AIZOACEAE.

X. *GISEKIA* L.

By R. S. ADAMSON.

The small genus *Gisekia* occurs throughout Central Africa and the warmer parts of Asia. The real systematic position of the genus has been the subject of much discussion. While it agrees with other members of Aizoaceae in habit, inflorescence and general floral structure, it diverges in having an apocarpus gynaeceum, on account of which it has often been referred to Phytolaccaceae. This was the view taken by Sonder, Fl. Cap. 1 : 155. 1860, and more recently by Heimerl in E. & P. Nat. Plf. 3. 1b.11. 1889, and by Phillips Gen. S.Afr. Pl. ed. 2.285. 1954. Against this Walter, Das Pflr. 4.83. 24. 1909, in his monograph on Phytolaccaceae definitely excludes the genus from that family. Bentham & Hooker, Gen. Pl. 1 : 859. 1867, regard it as belonging to Aizoaceae (Ficoideae) and this arrangement has been followed by Pax & Hoffmann, E. & P. ed. 2. 16c. 192. 1934, also by Hutchinson, Fam. Fl. Pl. ed. 1. 125, 1926, do. ed. 2. 429. 1959, and by Friedrich, Mitt. Bot. Munch. 12 : 58. 1955. The last two refer the genus to Molluginaceae which is treated as a separate family. Gagnepain, Bull. Bot. Soc. Fr. 65 : 17. 1918, advocated its transfer to Portulacaceae. His view has not received much support.

The genus is probably most nearly related to *Limeum* though the affinity is not very close. The schizocarpic fruit of *Limeum* may represent a development along lines that culminated in apocarpy in *Gisekia*. The curious dehiscence of the fruit of *Corbichonia* may be the result of a similar tendency towards carpel separation but along quite distinct lines.

GISEKIA

L. Mant. 2 : 554. 1771.

Koelreutera Murr. Nov. Comm. Gott. 3 : 67. t2. fl. 1772.

Miltus Lour. Fl. Coch. 1 : 363. 1790.

Herbs usually prostrate or sprawling, annual or with annual shoots. Leaves mostly opposite, often unequal, generally fasciculate, without stipules, separated by distinct internodes. Inflorescences terminal or at the nodes, cymose, often umbellate, often with two main branches, with or without a common peduncle. Flowers small, bisexual or less often unisexual. Perianth segments free, 3-veined, white yellowish or red inside. Stamens 5—15 or more, situated at the edges of a flattened disc

when isomerous alternate with the perianth segments. Ovary superior, of 5, or less often 3 or 10, carpels, each with one ovule, united at the centre only and soon separating: style on the inner edge of each carpel. Fruit of 5 achenes, usually muricate. Seeds black, swollen-reniform.

The type species is *G. pharnacioides* L.

The generic name has been variously spelt by different authors: *Gieseckia*, *Gieseckia*, *Giseckia*, *Gisechia*, *Gieseckia*.

A very uniform genus in habit. Stems many from the root. Glabrous or nearly so but often with minute hairs at the nodes and on the inflorescence. Leaves slightly succulent, pale or white below owing to white wart-like structures, either dots or more often linear streaks up to 0.25 mm. long. In the dry state these warts are slightly raised and hard. The inflorescence is few- or many-flowered and with or without a peduncle.

Sonder, Fl. Cap. 1 : 155. 1860, described three species but here they are reduced to two, both of which are very variable. It is not possible to carry out segregation until more detailed work on cultivation, genetics and cytology has been undertaken.

KEY TO THE SPECIES.

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| 1. Stamens 5: flowers on equal pedicels not extending at anthesis, opening together: perianth white or yellow | 1. <i>pharnacioides</i> |
| 2. Stamens 10—15: pedicels lengthening at anthesis: flowers opening in succession: perianth often red | 2. <i>africana</i> |

1. *G. pharnacioides* L. Mant. 2. 562. 1771.

Koelreutera molluginoides Murr. Nov. Comm. Gott. 3 : 67. 1773.

G. molluginoides Wight Calc. J. Nat. Hist. 17 : 162. 1847.

G. congesta Moq. in DC. Prod. 13.2 : 28. 1849.

Shoots prostrate, 10—80 cm. long, with internodes 2—7 cm. long and distant branches. Stems pale-coloured, terete or with short decurrent ridges below the leaves. Leaves mostly rather dark green above, whitish below, petiolate: blades linear, linear-oblong or oblanceolate, 1—5 cm. long, most commonly 2—3, 0.2—0.7 cm. wide, rounded at the tip or sometimes mucronate, at the base cuneate, the edges smooth, slightly revolute when dry, the midrib slightly projecting below. Petioles 0.3—0.5 cm. long, channelled above, usually with a few hairs on the edges. Inflorescence umbellate or often almost hemispherical, sessile or with a peduncle 0.5—2 cm. long, often with 2 main branches. Flowers few or many, with equal pedicels 2—4 mm. long opening simultaneously. Perianth segments 0.5—2.5 mm. long, rarely up to 3.5 mm., white, yellow or occasionally red inside, with membranous edges, the outer acute, the inner broad, obtuse, cucullate, often with a mucro behind the

tip. Stamens 5, the filaments dilated at the base. Fruit dark-coloured, rather densely covered with warts.

The type appears to be lost. In herb. *Linn.* there are two sheets (399. 1 & 2) of plants cultivated in the garden at Uppsala. As neotype a specimen in herb. *Montini* (S) is selected. This was sent by Banks in 1760. It is labelled "Ind. Or." which is the only habitat given by Linnaeus, and agrees fully with the cultivated specimens in herb. *Linn.*

The original spelling "*pharnacioides*" is used in preference to the more usual "*pharnaceoides*".

Variable in size, leaf-shape, length of the peduncle, and number and closeness of the flowers. *G. congesta* Moq. is merely a form with a many-flowered pedunculate inflorescence.

Open sites in rather dry regions. Mostly in the northern parts but extending to the eastern Karoo.

SOUTH WEST AFRICA. Lüderitz, *Hobart-Hampden* 16; Keetmanshoop, *Hobart-Hampden* 15; Gt. Karasberg, *Pearson* 8579; Gobes, *Pearson* 3742. Damaraland, *Een*.

CAPE.

VRYBURG. Vryburg, *Rodin* 3512 (p.pte.).

PRIESKA. Prieska, *Bryant* 1038, 1039.

KIMBERLEY. Kimberley, *Wilman*. K35; Modder Riv., *O. Kuntze*; *Silk* 194.

CARNARVON. Carnarvon, *Theron* 1637.

GRAAFF-REINET. Kendrew, *Galpin* 10062; Graaff-Reinet, *Bolus* 71.

MIDDELBURG. Grootfontein, *Theron* 443.

CRADOCK. Rietfontein, *Galpin* 5650.

QUEENSTOWN. Shiloh, *Baur* 902; Albert, *Cooper* 1349.

ORANGE FREE STATE.

WINBURG. Gedara, *Zeyher* 50; Rouxville, Caledon Riv., *Burke* 310; *Zeyher* 624; s.l. *Barber*.

TRANSVAAL.

ZOUTPANSBERG. Zoutpan, *Schweickerdt & Verdoorn* 545; west of Louis Trichardt, *Schlieben* 7544;

LETABA. Olifants Riv., *M. Moss* 18841;

WATERBERG. Klipheuvel, *Breyer*; Palala Riv., *Smuts & Gillet* 3337; Naboomspruit, *Galpin* M734.

POTGIETERSRUST. Potgietersrust, *Leendertz* 1276.

RUSTENBURG. Rustenburg, *Nation* 161; Magaliesberg *Burke*; *Mogg*;

PRETORIA. Wonderboom, *Thode* A425; Wilge Riv., *Schlechter* 3747; Onderstepoort, *C. A. Smith*;

NELSPRUIT. Pretorius Kop, *Codd & de Winter* 4913;

MARICO. Zeerust, *Thode* A1411.

NATAL.

ZULULAND. False Bay, *Gerrard* 1452.

Without locality:—*Harvey*; *Drege* 6228.

N.B. In many localities, especially the more southern, the species is recorded only from disturbed ground where it may be adventive rather than truly indigenous.

2. *G. africana* (Lour.) O. Kuntze Rev. Gen. 3.2 : 108. 1898.

Miltus africana Lour. Fl. Coch. 1 : 302. 1790.

G. miltus Fenzl Nov. Stirp. Dec. Vind. 10 : 86. 1839.

G. pentadecandra E. Mey. ex Moq. in DC. Prodr. 13.2 : 28. 1849.

G. aspera Klotzsch in Peters Reise Mozamb. Bot. 139. 1862.

Glinus mozambicensis Spreng. Syst. 2 : 467. 1825.

Very often tinged with red. Stem 5—50 cm. long, with internodes 2—8 cm. long, glabrous or with short muricate hairs at the nodes. Stems more or less ridged especially when dry. Leaves rather pale green above, whitish below, petiolate; blades linear, linear-oblong, oblong or obovate, 1—5 cm. long, 0.2—0.5 cm. wide, cuneate, the edges flat or slightly revolute. Petioles 0.2—0.5 cm. long. The upper leaves smaller and often alternate. Inflorescences often numerous at the branch tips, with or without a peduncle, usually with two main branches, sometimes nearly spherical. Flowers few or many, opening in succession, umbellate at least at the branch tips, very often red. Peduncles up to 5 cm. long, the main branches up to 3 cm., the pedicels short at first but lengthening to 0.3—0.8 cm. Perianth segments 2—4 mm. long, with red or white membranous margins, obtuse or subacute, the inner broader but flat when the flower opens. Stamens 10—15, rarely 8, occasionally 20 or more, some in pairs or groups of 3. Carpels rarely 10. Fruit as in *G. pharnacioides*.

Loureiro's type specimen appears to be lost. As neotype is selected a more or less contemporary specimen from the type locality "Mozambique" collected by *Forbes* (BM. co.K., TCD). This agrees well with the original description except that it is a small plant, 25—30 cm., instead of "4-pedales longus".

Open places in the northern districts. Throughout Central Africa south of the Sahara.

Very variable in size, in the form of the inflorescence, and the length of the peduncle. Two principal varieties are distinguishable:

Var. 1. *africana*.

Inflorescence umbellate or if lax with umbellate groups of flowers, if dense often hemispherical, usually with two main branches. Flowers most often red, few or more commonly numerous. Perianth segments 2—3 mm. long.

This variety includes a number of forms of which the extremes may look very distinct but which are connected by intermediates. Pending more detailed experimental work these forms cannot be given exact status.

The more apparent are:

(1) Inflorescence umbellate, most commonly many-flowered, often hemispherical, with or without a peduncle. The typical form.

(2) Inflorescence lax, cymose, the flowers distant or close, in threes on the ultimate branches. Inflorescence more or less flat-topped. Dry regions especially in the west.

(3) Inflorescences few, 3—7-flowered, on a long peduncle, the flowers distant, pedicellate. Leaves linear.

(4) Large plants with large leaves. Inflorescences at the nodes, few, 5—9-flowered. In the more tropical regions.

(5) Small. Leaves small, broad, sometimes almost rotund. Inflorescences at the nodes, few-flowered, without a peduncle. In damp or sheltered sites.

SOUTH WEST AFRICA. Okavango, *de Winter* 4135; Omuramba Mpungo, *de Winter* 3901; Okahandja, *Dinter* 186, 5146; Usakos, *Lindney*; Windhoek, *Jordan* 37; Rehoboth, *Strey* 2523-4; Outjo, *de Winter & Leistner* 5146; Haris, *Pearson* 9511; Sabiesis, *Pearson* 4599; Heikamschab, *Galpin & Pearson* 7464; Seekeim, *Pearson* 3737; Sandvernaar, *Pearson* 4681; Narudas Sud, *Pearson* 8580; Klein Karas, *Ortendal* 91; Gt. Fish Riv., *Pearson* 9700; Ramans Drift, *Pearson* 4062; Damaraland *Een*; *Pearson* 2892, 4284; *Rogers* 15259; *Worsdell*.

CAPE.

NAMAQUALAND. Wortel, *Pearson* 3618.

PRIESKA. Prieska, *Acocks* 12642; *Bryant* J196, 220, J220, 1038.

HAY. Griquatown, *Burchell* 1973; Orange Riv., *Burchell* 2107.

KIMBERLEY. Kimberley, *Wilman* K38.

TRANSVAAL.

ZOUTPANSBERG. Messina, *Rogers* 20018; Pafuri Riv., *Obermeyer* 670; s.l. *Smuts & Gillett* 4120.

PIETERSBURG. Silwane's Location, *Breyer*.

WATERBERG. Klipheuvcl, Breyer; Nylstroom, *Nelson* 291.

RUSTENBURG. Magaliesberg, *Worsdell*.

PRETORIA. Onderstepoort, *C. A. Smith* 6064; Matsaba, *Schlechter* 4575; Klippan, *Rehmann* 5194.

WITBANK. Wilge Riv., *Schlechter* 3747.

NELSPRUIT. Komatipoort, *Kirk* 69; *Rogers* 845; Skukuza, *Codd & de Winter* 4999.

NATAL.

ZULULAND. False Bay, *Gerstner* 5221.

Without locality:—*Drege* (*G. pentadecandra* E.M.).

Var. 2. *cymosa* Adamson var. nov.

Var. *pedunculata* (Oliv.) Brenan Mem. N.Y. Bot. Gds. 85 : 444. 1954. *p.pte.*

G. miltus var. *pedunculata* Oliv. Fl. Trop. Afr. 2 : 594. 1871. *p.pte.*

A typo differt caulibus longioribus, foliis inferioribus majoribus superioribus minoribus alternis, inflorescentiis aphyllis dichotomis, ramis et pedicellis perlongis ultimis racemiformibus, floribus magnis distantibus.

Stems up to 2 m. long, with internodes 2—18 cm. long. Leaves oblong, usually not white below, the lower 2·5—4 cm. long by 0·3—1·5 cm. wide, the upper much smaller and alternate. Inflorescence terminal and at the uppermost nodes, 10—35 cm. long, forking 3—4 times, the branches 2—7 cm. long, the ultimate pseudoracemose. Peduncle 3—7 cm. long. Pedicels slender, occasionally up to 2 cm. long. Flowers well separated. Perianth segments 3—5 mm. long, pink or white inside. Stamens 10—15 or more. Carpels often more than 5.

The type is *Schlechter* 11631 BM. co-type K.

In the lower and warmer parts on the east side of the continent, from Portuguese East Africa northwards to Tanganyika and Zanzibar.

Flowers sometimes dioecious. Inflorescence much exceeding the leaves, either regularly dichasial or with two or more branch systems. This has usually been referred to "var. *pedunculata*" but Oliver's original description is very short and covers a large range of forms. As the specimens he quotes both belong to var. *africana*, the name is not available. Burt-Davy, Man. Fl. Pl. Tvl. 1 : 53. 1926, suggested that this variety might be the plant originally collected by Loureiro. Except in size, Loureiro's description does not fit well. Further, all the earlier specimens seen belong to var. *africana*. The name "var. *Schlechteri*" has been written on sheets but there is no description.

TRANSVAAL.

ZOUTPANSBERG. Messina, *Rogers* 19488; Dongola, *Pole-Evans* 4466; Wylies Poort, *Rodin* 4227; nr. Louis Trichardt, *Schlieben* 7394;

WATERBERG. Rooikop, *Pole-Evans* 1240; *Smuts* 366;

LETABA. Sand River, *v. d. Schijff* 2201; Olifants Riv., *M. Moss* 18844;

NELSPRUIT. Komatipoort, *Rogers* 845.